The Impact of Macroeconomic Variables and Political Instability on Equity Returns of Stocks Listed at Pakistan Stock Exchange: A Study of Multifactor Model

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IN THE NAME OF ALLAH

(The Most Gracious, The Most Merciful)

وَاِنۡ يُّرِيۡدُوۡۤا اَنۡ يَّخۡدَعُوۡكَ فَاِنَّ حَسۡبَكَ اللّٰهُ ؕ هُوَ الَّذِىۡۤ
اَيَّدَكَ بِنَصۡرِهٖ وَبِالۡمُؤۡمِنِيۡنَۙ

Allâh is All-Sufficient for you. He it is Who has supported you with His Help and with the believers. (Quran 8:62)

DEDICATION

I earnestly dedicate the irksome task of mine

to

My loving Mother

Whose prayers are the assets of my life and these prayers served

as a guideline, prop during every difficult moment of my life,

and made me what I am today.

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JAWAD AHMED

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ABSTRACT

The study analysis the asset pricing mechanism by using Capital Assets Pricing Model and Fama and Macbeth (1973) asset pricing methodology for the non-financial stocks in equity market of Pakistan. The monthly data for size premium, value premium, macroeconomic uncertainty and political risk is taken from June 2005 to June 2018. The result of single factor model indicates that market is positive and significant for all portfolios. Whereas, by employing Fama and French model increase the predictability of explanatory variables. The regression analysis shows that size premium has positive and significant impact on small portfolio while, it has significant but negative association with returns of big stock. Furthermore, the findings suggest that value premium is significant and negative for high book to market stock. The results also reveal that macroeconomic uncertainty has not shown any significant impact on portfolio returns. There is also a worth mentioning that political risk has shown negative and significant impact for all stocks except B/L. Results concluded that political uncertainty effect is present in equity market of Pakistan. These findings are robust with many previous studies. Theses empirical evidence are warrant that the investor should consider these risks before making any investment decision.

Key words: Capital Asset Pricing Model, Fama and French multifactor model, Size premium, Value premium, Macroeconomic Uncertainty, Political Risk

CHAPTER 1

INTRODUCTION

1.1 Introduction

Stock returns of companies are influenced by the different political risk which are associated with government actions and conflicts. Assessment of political uncertainty is one of the important tasks to make any investment decision (Bekaert G et al., 2014). Capital market is a vital player and provide platform to producer and investor to mobilize their resources by investing in the stock of companies. Before making any investment decision, it is a fundamental factor to be consider that how the stock prices are adjusted. Over the past three decades, there is extensive literature have been endeavored to explain the asset pricing models. Capital asset pricing model (CAPM) of Sharpe (1964), Lintner (1965) and Black (1972) makes major contribution in understanding the relationship between risk and returns.

Earlier literature has explored several economic and political factors which have significant association with equity returns. The rationality-based asset pricing theories of Sharp (1964), Lintner (1965) and Black (1972) emphasizes that the expected returns can be explain by betas, or factor loading that effects the economic activity Merton (1973), Ross (1976) and Breeden (1979). With the passage of time, number of studies identifies that the market returns cannot be predicted by single factor. Based on, Capital Asset Pricing Model (CAPM), Stephen Ross (1976) proposed Arbitrage pricing theory (APT) and explains unlike the CAPM, APT estimates that not only systematic risk factor but there are large number of other factors which are responsible for the stock market returns. Therefore, multi-factor model was introduced to estimate the several other factors which influence the stock prices. However, factors and number of factors

are not identified in advance. The researchers identify three type of factors included firm specific factors, macroeconomic factors, and statistical factors.

This dissertation examines the asset pricing implication on non-financial companies registered at Pakistan Stock exchange (PSX). It also investigates the impact of size, (BTM) and additional factor of macroeconomic uncertainty and political risk. Banz (1981) Basu (1983) identifies small firm effect as an evidence of existence of asset pricing anomalies. Similarly, Fama and French (1992) examined the company specific variables such as B/M, size of firm, earning price ratio and leverage ratio as firm specific anomalies which explaining the equity returns. Based on arbitrage pricing theory (APT) framework, Fama and French (1993, 1995, 1996, 1998) and Davis et al. (2000) presented an alternate multi-factor model. Particularly, F&F (1993,1998) emphasizes that the size and book to market capture certain distressed factors. In contrast, (Chen et al, 1986) examine the impact of macroeconomic factors such as risk premium, inflation, oil prices, industrial production and term structure on U.S stock market and identified that these variables strongly explains the cross section of stock prices. The impact of macroeconomic factor is significantly positive as well as negative on the performance of stock market and it is also reflected by the behavior of these variables itself (Kumar, 2013).

There are number of actors who influence the stock market returns and volatility (Liu & Shrestha, 2008). According to general asset pricing theory investment decision is not only based on expected stock returns but also determined by the other risk factors as well. Hence, Pakistan equity market has also been affected by multiple risk factors over the last three decades, domestic factors and political environment also affects the development of financial market and stock returns. Uncertain political condition,

internal and external conflicts distresses the investor sentiments and in this situation the investor is always reluctant to invest in a country's stock market.

Political instability significantly effects the stock market. In emerging economics more politically secured environment positively affect the stock market returns (Perotti & Oijen, 2001). Assessment of political situation on expected cashflows and discount rate is a fundamental factor before making an investment decision by multinational corporations (Bekaert et al, 2016). In asset pricing framework, investigating the impact of political instability on stock return is relatively new and emerging. Instable political system effects the market perception thus it has pricing effect on returns (Berkman et al, 2011). Similarly, Pastor and Veronesi, (2012, 2013) conclude that expected stock returns and capital market participation is affected by the political uncertainty. Therefore, Instable political system declines the stock market returns and inflation negatively affect the stock market prices (Hira, 2017).

Traditionally, most of the researchers has conducted their studies focused on specific political events at country level stock return (i.e., Kim and Mei, 2001; Chen, et al, 2016; Hira, 2017; Hillier and Loncan, 2019). However, recent literature has open new avenues by evaluating the impact of political risk at company's level stock returns (i.e., Kim and Mei, 2001; Chen, et al, 2016; Hira, 2017; Hillier and Loncan, 2019). By evaluating the political risk at individual companies these studies have investigated the relationship between stock market behavior in different political situations. These studies suggested that the political uncertainty have significant impact on the companies returns (e.g., Faccio and McConnell, 2005; Cashman, et al, 2016; Hu and Xu, 2017).

This study contrasts in numerous critical ways. Most of the studies has focused on the country stock returns and economy-wide responses to political risk, whereas, in

this analysis focused on companies' responses in different political regimes. As it is evident that political risk response differently for different companies.

In practice, to evaluate and quantify political risk is a difficult task (Henisz & Zelner, 2010). However, many research organizations (ICRG, Moody's Investment services, S & P Ratings, BERI and The Economist) provides the quantitative political risk measures. Hence, International country risk guide (ICRG) provides more appropriate and continues risk rating throughout the year. Many researchers use these ratings in their analysis and concluded that International Country Risk Guide (ICRG) is more reliable among all organization providing risk rating. Moreover, these ratings have more explanatory power to predict the stock market movement (Hoti and McAleer, 2005; Lehkonen and Heimonen, 2015; Nebojsa et al., 2015; Toramana and Tuncay, 2017).

This thesis explores the asset pricing implications on financial stock returns in case of Pakistan. It analyses the validity of size, value and macroeconomic uncertainty on financial stock market returns as well as by adding the effect of new additional factor that is political risk. Earlier studies have investigated the influence of political events on stock returns at county level. The study explores the influence of political instability on equity returns of non-financial companies listed at PSX. This analysis is an addition of F&F three-factor model to check the existence of political risk effect in equity market. Thus, our analysis is used to study the effect of APT by using (Fama & Macbeth, 1973) two pass regression model as well as by establishing a multi-factor model for additional political risk premium.

1.2 Problem Statement

It is reasonable to expect political risks to influence the returns in financial markets. Firms are affected directly or indirectly by the political structure of a country (Toramana & Tuncay, 2017). It has become a worldwide phenomenon that the political uncertainty affects the financial markets adversely (Nasimi, 2018). Therefore, it is of great importance to explore the consequence of political instability along with macroeconomic uncertainty and company specific risks on stock returns. Various studies have analyzed the effect of political risk on country level equity returns but there is less evident available to investigate company returns. hence, there is a dire need to investigate that political uncertainty is also determinative on the valuation of assets in the equity markets along with other factors.

For this purpose, multifactor model can better predict the fluctuations in equity return. Along with size and value premium, political risk can also be used to estimate the variations in stock return. Mispricing of the securities in the market calls for a better asset-pricing model. The factors are also sector and country specific according to many researchers so it could also be tested in different financial sectors (Fama & French 2012).

Thus, it is necessary to examine these factors in equity market by using the methodology of (Fama & Macbeth 1973) regression model as well as by adding an additional factor of political risk rating by adopting multi-factor model approach.

1.3 Research Questions

The study will try to address the following questions:

1. Does size and value (BTM) premium explains stock returns of non-financial firms?

2. How does macroeconomic risk effects the equity returns?
3. Do political risks have a statistically significant effect on the equity returns?
4. Weather, political risk can be an additional risk in determining the Asset Pricing model?

1.4 Objective of the Study

- To investigate the validity of size and value (BTM) anomaly on non-financial firms registered on Pakistan Stock Exchange.
- To check the influence of macroeconomic risk index on equity returns.
- To reveal that, in valuation of assets in capital market political uncertainty is also a determinative factor.

1.5 Significance of the Study

The study would increase the body of knowledge in several ways which has not been done earlier on Pakistan to the best of my knowledge. Many empirical studies that has taken different measures of political risk, there has not been a study to our knowledge, particularly, in case of Pakistan that utilized the measures of political risk that will be use in our analysis, which is explained in next chapter. Moreover, effect of political uncertainty on financial markets is a proper appreciation that continues to be overriding interest of managers, investors, and academics. It provides guidance to policymakers and investors alike. First, it enhances the skills of investors in their decision making by providing them empirical based knowledge of stock behavior during political uncertainty.

Second, the knowledge of the association of firm fundamental risks, political risk and macroeconomic uncertainty helps the investors to know the appropriate timing of entry and exit into/from stock market. Third, the knowledge of the impact of

microeconomic and macroeconomic uncertainty helps investors and managers in risk management. However, it helps the policymakers to develop economy and stock market by managing the macroeconomic factors efficiently. Lastly, it helps in portfolio allocation decision. Thus, this research makes it possible to assess how firm level risks, political instability, and macroeconomic uncertainty influences stock returns, particularly, in the context of PSX. Moreover, it abridges the literature gap by extending the literature on effect of various political measures and macroeconomic risk on equity returns and will also open future avenue for researchers.

1.6 Outline of Thesis

This thesis is comprising of five chapters. Introductory chapter provides information about the size, value, political and macroeconomic uncertainty on market returns. Insights about theoretical background, relevant existing literature and their findings are provided in 2nd chapter of the study. The discussion about data and methodology is being applied in this thesis is explained in chapter three. Chapter four includes descriptive statistics and the results of regression analysis. Finally, the last chapter consist of result-oriented conclusion and it also provide insights about research limitation, its implications, and avenues for future research.

CHAPTER 2

THEORETICAL BACKGROUND

The foundation of Asset pricing Theory is laid down on the portfolio theory of Markowitz (1952). While, Sharpe (1964) and Lintner (1965) had established Capital Assets Pricing Model by working on different markets. This model contributed the fact that only market beta is sufficient to detect all the risks in capital market related to price and returns of portfolio. With the passage of time, number of studies identifies that the market returns cannot be predicted by single factor. Based on, Capital Asset Pricing Model (CAPM), Stephen Ross (1976) proposed Arbitrage pricing theory (APT) and explains unlike the CAPM, APT identifies that not only systematic risk factor but there are large number of other factors which are responsible for the stock market returns. However, number of factors has been introduced in the literature of capital asset pricing model from last two decades.

2.1 Theories:

2.1.1 Modern Portfolio Theory (MPT)

The foundation of modern portfolio theory is laid by Markowitz (1952). The model explains the association between risk and portfolio returns. This model reveals that investor can maximize the expected returns by considering the given level of risk. This theory also explains that high returns are associated with highly risk stocks and vise versa. The investor can reduce the risk by diversifying its stock. “Don’t put all your eggs in single basket” is the key assumption of this model. However, there is no mathematical formula has been explained for this model to identify the relationship between expected returns and risk. After that Sharp (1964) has measured the systematic

risk mathematically. Sharp introduced Capital assets pricing model, a single factor model based on systematic risk.

2.1.2 Capital Asset Pricing Model (CAPM)

The Capital Asset Pricing Model of Sharp (1964) describe the association between systematic risk and unsystematic risk. The systematic risk cannot be diversified away. Recessions, war and terror and interest rate are some type of systematic risk. Whereas, unsystematic risks are "specific risk" these are linked with the individual stocks. According to this theory the portfolio investors earn reward against that risk which cannot be diversified during their investment decision. The non-diversifiable risk is term as beta and expected returns are associated with that beta. CAPM is widely acceptable and used globally in many financial institutions.

The Capital Asset Pricing Model is criticized by many researchers that all the risky assets of market portfolio can not be observed. Roll (1977) Argued that beta is not sufficient to capture all the risk linked with expected returns. Whereas, there are number of other factors that are also responsible to affect the returns. Fama and French proved these criticisms empirically.

2.1.3 Arbitrage Pricing Theory (APT)

To address the criticisms on CAPM Ross (1976) has presented Arbitrage theory while managing the preliminary concept of CAMP. Based on less restrictive assumptions and most common approach the arbitrage pricing theory can also be substitute of CAPM. Because of focusing on the "Law of One Price" this is considered as unique approach to evaluate asset pricing model. The assumption of "law of one price" means that the prices of same commodities cannot be differentiated. Based on

numerous procedures and assumptions CAMP and APT both approaches are used to study the expected risk and return relationship.

On asset pricing mechanism CAPM and APT both are very significant and useful model. CAPM model is most commonly used in different research work and based on the portfolio selection theory. This model is considered as most powerful tool to predict the expected returns. The APT is based on three common available assumptions. First assumption of this model is that investment for more wealth provides high returns than less wealth. Secondly, the return generating process is leaner function of number of different factors. Furthermore, it also based on the assumption of existence of perfectly competitive market.

The dominant literature has identified numerous anomalies while reviewing APT model. Base (1983) has identifies different macroeconomic anomalies. Benz (1981) has address that small stocks outperform the big stocks portfolio. Iqbal et al, (2012) analyze the irregularities in Pakistan's stock market by considering the data of Microeconomic variables and concluded the significance and legitimacy of APT to predict stock returns.

CHAPTER 3

LITERATURE REVIEW

This section will provide overview of theoretical background and relevant literature about this thesis. This chapter will explain the relevant theories on which this dissertation is centered, and the second part will enlighten the relationship between size, vale, macroeconomic instability, political instability, and stock returns.

3.1 International Review

3.1.1 Size and Value Premium

The foundation of Asset pricing Theory is laid down on the portfolio theory of Markowitz (1952). While, Sharpe (1964) and Lintner (1965) had established Capital Assets Pricing Model by working on different markets. This model contributed the fact that only market beta is sufficient to detect all the risks in capital market related to price and returns of portfolio. Fama and Macbeth (1973) and (Black et, al 1972) uses the monthly data of US stock market to investigate the validity of CAPM. Whereas, results justify the validity of CAPM, and the model become prominent to describe association with market risk and portfolio returns.

Later, several studies identify that single market-beta is not enough to capture all the risk related with stock returns. These studies propose that there are multiple factors which influence the stock market and these factors are named as anomalies (Fama & French, 1995). Criticism on Sharpe (1964) and Lintner (1965) CAPM gave birth to the concept of anomalies, which are identified and not explained by the previous model. Size anomaly is identified by Banz (1981) by using data set of NYSE from 1926-1975. The results revels that the size of a company also matter, as earnings of smaller companies are higher than the high value companies. Explanatory power of

traditional CAPM improves after incorporating the size effect in the model. Later, Basu (1983), Fama and French (1993) conducted a study in different stocks to justify the validity of size anomaly. The results revel negative correlation between size and market returns. Fama and French (1993) extended the one factor model by including size and B/M anomily and proposed three factor model. The model is validas the explanatory power of traditional CAPM improves after including the additional premium in the model.

To analysis the association among B/M and stock returns Rosenberg et al. (1985) conducted a study and concluded the positive relationship among them. Ball (1978) also challenged the CAPM's mean-variance efficiency and conclude that CAPM cannot explain the market anomalies. The study urged on the importance of improved model for risk return relationship.

CAPM model is also challenged by Fama and French (1992) and specified that B/M, size and Earning price ratio are the variables which can also be used as risks related to stock market returns. Study showed that for describing the average returns, market beta was in-efficient. Results also showed that B/M and size are efficiently absorbed the effects of other variables i.e. leverage and E/P because of high correlation among them. Thus, concluded that size and B/M are important variables to capture average market returns as compared to the market beta (Fama, & French, 1992). Asian markets such as Philippines, Malaysia and Hong Kong were studied by (Drew, 2003) and stated that CAPM is an inadequate for explaining equity returns and may lead to the assets mispricing. These results also reveal that Value factor and size as proposed by (Fama & French 1992) has improved explanatory power of multi factor model.

Sehgal and Tripathi (2005) has found that market capitilization size premium is highly significant in Indian financial market. Author used the monthly data of total sale, total asset, net worth, market capitalization and value of firms listed at Indian stock market. Similarly, Mirza and Shahid (2008) capitalizing the daily data of 81 non-financial companies in KSE by incorporating Fama and French approach. The finding suggested that the significant impact of addition of size and B/M premium in KSE. The finding is robust with the acceptability of the model in emerging market. The study of Hassan and Javed (2011) conducted a similar study by using monthly data of 250 non-financial stocks listed at KSE. The study reveals the validity of CAPM however, size and value premium are more predictable than the CAPM. The study disclose that size and B/M is significantly positive to portfolio return. Whereas, size is insignificant for big capitalization portfolios.

F&F (2012) prolonged their work to 23 different countries of four regions including Japan, North America, Asia Pacific and Europe. This study analyse the monthly data of 22 years to estimate the effect of CAPM including size, B/M and momentum on equity return of these regions. The result suggested that except Japan size and value significantly affect the stock return of all regions. Moreover, this study strongly validates the effect of size and value premium on returns.

Mazviona and Nyangara (2014) Undertake the study in Zimbabwe stock exchange and determined that the size is a price factor and have significant impact on equity market. Similarly, Farhan and Sharif (2015) also suggested that size is negatively related with Karachi stock market returns. To analyze the Fama and French multifactor model on financial and non-financial sector of U.S stock market Baek and Bilson, (2015) assess that size and value premium has significant related as a commen risk factor on both financial and non-financial corporations. Xie and Qu (2016) presented

the analysis of Fama and French (1992,1993) methodology using the monthly data set from period of 2005-2012 in Shanghai Stock Exchange. These results are robust with the previous findings that size, and B/M premium are priced factor in chines stock market.

Rehman and Gul (2017) has analyze the quarterly data of firm and market level variables from year 1999 to 2015 to predict the returns of Karachi Stock Exchange (KSE). The data is separated into pre-financial crises and post-financial crises period of 2007-08. The findings depict that size and B/M are insignificant during both crises period. Furthermore, size has significant impact on the predictability of the equity return for the overall sample period. Shaikh and Kashif (2017) applied Fama and French (1993, 2015) multifactor approach to analysis the growth anomaly effect on KSE. This study analysis the monthly data set from year 2005-2015. The statistical findings are parallel with the findings of Fama and French (1993, 2015) and proved the presence of growth anomaly in KSE. Moreover, results further explain that low growth companies provide high rewards as compared to high growth firms.

Garcia and Oliveira (2018) has empirically analyze the portfolios of growth and value in five European Union PIIGS stock markets from 2003 to 2015. The findings are robust with the earlier literature and concluded that value premium is significant indicator of stock returns. Likewise, Le et al. (2018) has presented a study to estimate the consequences of Price-to-book ratio, size, and political risk on Vietnam equity market. These results predict that small firms outperform than big firms. Moreover, inclusion of size and P/B increase the predictability of the model. Whereas, additional political risk has no significant impact on average returns of the stock. Hu et al., (2018) empirically investigates the size and B/M premium effect in chines market and reveal that the empirical findings are contradicted with earlier studies. The result indicated that

size of firms has significant impact on stock returns whereas, B/M has no significant impact on the returns. Study concluded that these results are contradicted with previous studies because of high volatility in small number of stocks during estimated period.

3.2.2 Macroeconomic Uncertainty

Macroeconomic uncertainty play an important role in fluctuating the equity market fundamentals. Initially, Chen et al. (1986) introduce new risk premium which are termed as macroeconomic anomalies. The study is used to analyses the macroeconomic variables such as inflation, oil prices, term spread, industrial production, consumption, and NYSE stock returns. The results suggested that most of these macroeconomic variables significantly contribute to stock returns and volatility. Hamao (1988) conducted similar study with the framework of multifactor APT in Japanese stock market and concluded that expected inflation influences the market returns. Similarly, Clare and Thomas (1994) analyses the consequence of macroeeconomic risk factors on UK stock market and results reported that macroeconomic factors are peiced factor.

Kwon et al. (1997) extended this work from developed to the developing stock markets. The findings of the studies reveal that macroeconomic risk factors are also priced in developing stock markets. Furthermore, in emerging market investor's perception of equity return is different from developed financial markets like Japan and U.S. Maghayereh (2003) analysis the long-run behavior of macroeconomic variables on Jordan's equity market. The results indicate that macroeconomic variables inflation, export, interest rate, foreign reserves, and industrial production effect the stock prices. Acikalin et al. (2008) carried out an investigation to examine the empirical evidence from Istanbul stock exchange by using quarterly data set of interest rate, current account balance, exchange rate and GDP. It concludes that the prices are significantly affected

by the current account, GDP, and exchange rate. Similar study has been conducted by Rahman et al. (2009) in Malaysian equity market. The result shows that money supply and exchange rate is negatively related with returns however industrial production, reserves and interest rate has positive impact on market returns. Whereas, Sohail and Hussain (2009) explored the associations between macroeconomic factors and equity return in case of Pakistan. It employs monthly data of non-financial stock from 2002-2008 listed at Lahore stock exchange. Results displays that in long-run money supply, real effective exchange rate and industrial pr0duction index is positively associated with equity return.

Shubita and Al-Sharkas (2010) added in the literature by examining the impact of size and macroeconomic variable on New York stock prices. Findings reveal that size not only significantly effects prices of stock, but real economic activity also effect the stock prices positively. Likewise, Aretz et al. (2011) constructed portfolio based on size, value and momentum factor include additional variables of exchange rate, inflation, and interest rate as proxy of macroeconomic uncertainty. The finding of conditional and unconditional asset pricing tests shows that the above macroeconomic variables are priced factor.

Haque and Sarwar (2012) determine the relationship between fluctuation of macroeconomic and individual equity returns. Author analysis the data of 394 non-financial stocks of KSE from year 1998-2009. The statistical results explore that macroeconomic volatility effect differently at every sector. Whereas, interest rate, budget deficit, money supply and inflation are negatively corelated with stock prices. Herwany et al., (2014) investigated the stock market behavior by applying CAPM, APT and multi-factor model. The findings have proposed that the macroeconomic risk interest rate, CPI, market capitalization and exchange rate risk premium has statistically

significant impact on excess return of portfolios. Likewise, Asgharian et al. (2015) analysis the long run movement of stock and bond volatility in Philadelphia. Quarterly data from 1968-2014 has been taken for the analysis. ARCH-GARCH method is used to capture uncertainty of seven macroeconomic risks. Furthermore, principle component analysis (PCA) is used to create an index for uncertainty. The finding of the study diagnosed that investor move toward safer investment when there is high macroeconomic risk.

Amtiran et al., (2017) explored the relationship among macroeconomic and equity prices through APT approach. The result of study proposed that these macroeconomic risks highly influence the Indonesian stock prices. Moreover, interest rate and exchange rate fluctuation significantly influence the returns. Mubarik and Javid (2018) investigated the relationship among stock return and macroeconomic volatality in Karachi Stock Exchange. Monthly data of 50 stocks has been utilized from year 1998-2014. The findings proposed industrial producti0n affects negitively whareas, stock return volatality is possitively affected by the exchange rate flactuation. Finally, studey has concluded that macroeconmic uncertanity has significant impact on volatality of equity prices in Pakistan. Hence, Economic policy uncertainty and macroeconomic variables have significant impact on the corporate performance (Abaidoo, 2019).

3.2.3 Political Risk

Empirically, abounded of literature have been explained that political condition of a country affects the investor behavior and the returns of equity market. Stock market of developing and emerging economies has seen volatile behavior by the uncertain and instable political situation of a country (Mei & Guo, 2004). Diamonte, Liew and Stevens, (1996) had found that political risk lower the stock market returns thus

indicated that presence of anomaly and explained the importance of political stability on equity market. Erb and Viskanta (1998) contributed the fact that political risk factor effects the investment decision and stock market returns. Favorable political news is positive associated to investment decision and returns on the market as compared with economic news Chan et al., (2001). Several literatures have supported these findings.

Bilson et al. (2003) has established the link between political risk and equity returns in 17 emerging and 18 developed countries. The findings are in favor of explaining the variation in returns due to political risk factor in emerging markets, but the results did not support in case of developed economies. Furthermore, in emerging markets empirical result has shown positive association among political risk and return. Harvey (2005) has conducted a similar study in emerging markets to analyses the effect of political, financial, and economic risk on portfolio and direct investment. This research has shown that equity returns in emerging markets are significantly affected by these country risk ratings.

Busse and Hefeker (2007) Determine the association between political instability, foreign direct investment, and institutions by estimating the data of 83 developing countries. The sample period of the study is from 1984-2003. The empirical result identifies that foreign direct investment is highly determined by political condition of a country. likewise, Girard and Omran, (2007) also investigated the risks which have impact on the investment decision of five emerging Arab financial markets. The results explore that any change in political condition of a country significantly effects the excess returns and development of financial market. Moreover, this study reveals that pricing model has shown significant explanatory power than CAPM after adding firm specific and country risk factors. According to Henderson and Garza Rodriguez (2008) equity returns and financial market performance is affected by the

political risk because, political situation of a country effects the working of firms directly or indirectly.

Qureshi et al. (2010) have observed the role of political instability on the equity market returns taking as proxy of economic growth in Pakistan. The study uses the sample period from 1971 to 2008 and apply OLS methodology. By applying principal component technique, the author constructed the political instability index of seven different variables. This research proposed that political instability and economic development are negatively correlation. According to the empirical statistics during the periods of high political disturbance stock market affected negatively. Boutchkova et al. (2012) investigated the consequence of political uncertainty on different industries in U.S. The results suggested that political outcomes influence industry returns volatility. The study also discloses that when political instability in domestic country is high contract enforcement, labor intensive and more trade dependent industries shows greater return volatility. Paster and Veronesi (2013) studies the effect of political instability on the movement of stock prices. They showed that the political uncertainty not only increases return volatilities and correlations but also equity risk premium.

Gul et., al (2013) studied the influence of political risk on the financial sector of KSE from the period of 2007-2010. The sample of 14 financial companies listed at KSE is used in this study. The result showed that stock returns have significant negative affected by the political events. Similarly, Nazir at el. (2014) scrutinized the effect of political events on the capital market of Pakistan. In his analysis author took data from 1999 to 2011 and made comparison of efficiency of market between military and elected government. Statics showed considerable impact of political events on KSE-100 Index returns. Moreover, the study explains that during autocratic government political situation remain stable as compared to democratic period. Furthermore,

magnitude of different political event was different during autocratic and democratic government therefore, it is tough to describe the efficiency of market during both regimes.

Lehkonen and Heimonen (2015) also explore the associations among political risk and democracy by analyzing the data of 49 emerging markets stock market returns for 2000-2012. This study concluded that continuity of democratic system for certain period, reduces the political risk level. Thereafter, more stable political environment provides batter opportunities and confidence to the investors and gives higher return. Furthermore, political risk and equity returns are found to be positively related. Murtaza et al. (2015) states that the overall market performance in Pakistan is influenced by the political risk that discourages the investors sentiment to invest. Furthermore, these results proposed that Price behavior of KSE reacts differently to every political event.

Khan et al. (2016) investigate the effect of general election of 2013 on equity prices by using the sample of 50 public limited companies in KSE. The result indicates that publicly listed firms respond negatively to such political events. Furthermore, the share prices of large size companies have shown positive response to this event. The study further highlighted that more profitable firms has shown low volatility during this period as compared to less profitable stokes. Kelly et al. (2016) also investigated the pricing of political risks. The findings showed that political uncertainty effects the equity option markets.

Similarly, Liu et al. (2017) has presented a study to establish the relation of political instability on asset prices of Chines firms. The sample targeted for the study was 1,862 non-financial firms listed in financial market. The findings suggest that the share prices of more political sensitive firms will fall because of political uncertainty.

Narayan et al. (2017) analyzed that political unrest influences the corporate investment at country level industries and these industries are affected differently at their level of exposure to political risk. Political instability also deteriorates the inflows and outflows of foreign direct investment (FDI). The result shows that 1% decrease in the political risk gives 12% rise to net-inflows of foreign direct investment. Hira, (2017) investigated relationship among political instability and macroeconomic factors on equity market returns and volatility in Pakistan stock market. For this purpose, data was collected from 1998 to 2012 and findings suggested that instable political system decline the equity returns. Hence, inflation also negatively affect the stock prices.

Nazir et al. (2018) investigated the consequences of terrorism and political instability in South Asian countries by analyzing the sample of Pakistan, India, Bangladesh and Sri Lankan stock markets for 2005-2016 and estimated that terrorism and political instability are price factor in stock returns of South Asian Countries. Nasimi (2018) examined the association among political risk, macroeconomic and stock returns focusing the United Kingdom market. They have collected sample of 23 manufacturing firms from the year 2005-2016 listed at FTSE-100 index. This research predicts that both macroeconomic and political uncertainty significantly effects the stock returns. But macroeconomic risk has more pronounced effect than the political risk.

Similarly, Hill et al. (2019), investigated the connection of U.K. firms to Brexit which resulted an unprecedented rise in political uncertainty. The result shows that Brexit announcement create political uncertainty in UK, which adversely affect the high growth firms. Financial and consumer financing sector is badly affected because of the highest exposure of these sectors to Brexit related uncertainty.

3.3 Research Gap

Despite immense literature on size, vale and macro-factors effects on financial markets, there has been few empirical studies, particularly, on the effects of political risk on stock market at firm level in Pakistan. There is various empirical studies that has taken different measures of political risk, there has not been a study to our knowledge, particularly, in case of Pakistan that utilized the measures of political risk that has been used in this study, which is explained in next chapter. Most of these studies investigate the specific political event to analysis the short run behavior of equity returns. This thesis, focused on the relationship of company specific variables, macroeconomic factors and political risk with firm's stock returns focusing the Pakistan stock market. Particularly, from 2005 to 2018 for 120 non-financial firms that are listed at PSX-100 Index.

CHAPTER 4

DATA AND METHODOLOGY

This thesis explains the relationship of stock returns and multiple factors that are market, size, value, macroeconomic instability, and political risk. The data of 120 non-financial companies is collected for analysis. The sample of the study starts from July 2005 to June 2018. This study employs extended version of Fama and French (2002) multi-factor model. For constructing these representing risk factors this study follows the procedure described in Fama and French (1993) by adding additional macroeconomic and political risk factors.

4.1 Data and Sample

For empirical analysis monthly data of real effective exchange rate (EXR), industrial production (IP), Consumer price index (CPI) and Broad money (M2) has been used to construct the macroeconomic uncertainty index (MUI) by using principle component analysis (PCA). Data of these variables are available at World Development Indicator (WDI) and Data Warehouse of State Bank of Pakistan (SBP). Similarly, monthly data for political risk of government stability, socio-economic condition, internal conflict, and external conflict has been collected from political risk services group (PRS) which will be explained later in this section.

For analysis, data set of 120 non-financial firms are selected randomly which are listed at PSX. Most of the studies related to macroeconomic uncertainty and political risk are conducted on country level stock returns therefore, purpose to conduct the study is to investigate the effect of these risks on company returns. Financial and non-financial companies have different accounting year therefore, financial companies

like, banks, investment companies and insurance companies are excluded from our analysis and this study only select the sample of non-financial companies.

4.2 Criteria and Limitation for Sample Selection

This study employs monthly data of closed prices of all non-financial stocks listed at PSX from the period of June-2005 to June-2018 by using following criteria:

1. The data of all non-financial public limited companies is collected which are listed at PSX.
2. Financial and non-financial companies have different accounting year therefore, financial companies like, banks, investment companies and insurance companies are excluded from our analysis and this study only select the sample of non-financial companies.
3. It was essential for companies that both market, and accounting data is available to be a part of our sample.
4. Stocks with negative B-to-M ratio are also not included in sample.
5. To avoid thinly traded stock, only those stocks are considered which are traded at least eight months in a year.
6. The selected sample has been sorted based on market capitalization and further compared across sectors. For the complete representation of the market 75% of big size companies and 25% 0f extremely small size stocks are included in the sample. Based on mentioned criteria 120 firms were selected.

Based on above criteria, sample of listed companies has been selected which is mentioned in appendix. These selected stocks have high average market capitalization throughout the sample period and all the sectors of the economy is efficiently represented by them.

4.3 Data Sources

Time series monthly data of macroeconomic factors Industrial Production (IP), Exchange Rate (EXR) and for inflation data of Consumer price Index (CPI) is extracted from world Development Indicator (WDI). Broad money (M2) and six-month T-bill data is collected from State bank of Pakistan. Six-month T-bill is used as a proxy of risk-free rate and monthly data of stock prices is obtained from yahoo finance. Data of non-financial companies are taken from financial statements of respective companies and financial statements provided by SBP. Information of political instability is attained from the International Country Risk Guide (ICRG) provided by the Political Risk Services (PRS) Group.

4.4 Methodological Framework

4.4.1 Unit Root Test

The estimating process usually starts from examining the properties of variables like stationarity of data. Non-stationary variables cannot be modeled and used to forecast future prediction because it produces spurious results. Generally macroeconomic and financial data is not stationary and have a problem of unit root. It is important to have a stationary data to predict reliable and appropriate results to predict future. Therefore, plenty of tests that can be used to inspect the stationarity of the variables, for example Dicky and Fuller (ADF) test (Dickey & Fuller, 1981), (Phillips & Perron, 1988) are most commonly used for testing the stationarity. The study is using monthly time series data for the analysis and it is quite often that monthly time series data have possibility of seasonal unit root. An extended version of HEGY (1990) test for seasonal unit root, Beaulieu and Miron (1992) is more appropriate method to capture the seasonal effect in monthly data.

4.4.2 Unit Root Test

The extended version of HEGY (Hylleberg, Engle, Granger, & Yoo, 1990) Beaulieu and Miron (1992) is used to estimate the seasonal unit root in monthly data. Beaulieu and Miron (1992) provides 13 equations to estimate the seasonal unit root at zero, annual and at biannual frequency for monthly time series data. To estimate equation, it generates eleven dummies for seasonality, lags of dependent variable trend and constant. Series is generated by using following process:

$$Y_t = \left(1 + Ƀ + Ƀ^2 + Ƀ^3 + Ƀ^4 + Ƀ^5 + Ƀ^6 + Ƀ^7 + Ƀ^8 + Ƀ^9 + Ƀ^{10} + Ƀ^{11}\right)Y_t$$

$$Y_{2t} = -\left(1 - Ƀ + Ƀ^2 - Ƀ^3 + Ƀ^4 - Ƀ^5 + Ƀ^6 - Ƀ^7 + Ƀ^8 - Ƀ^9 + Ƀ^{10} - Ƀ^{11}\right)Y_t$$

$$Y_{3t} = -\left(Ƀ - Ƀ^3 + Ƀ^5 - Ƀ^7 + Ƀ^9 - Ƀ^{11}\right)Y_t$$

$$Y_{4t} = -\left(1 - Ƀ^2 + Ƀ^4 - Ƀ^6 + Ƀ^8 - Ƀ^{10}\right)Y_t$$

$$Y_{5t} = -\frac{1}{2}\left(1 + Ƀ - 2Ƀ^2 + Ƀ^3 + Ƀ^4 - 2Ƀ^5 + Ƀ^6 + Ƀ^7 - 2Ƀ^8 + Ƀ^9 + Ƀ^{10} - 11Ƀ^{11}\right)Y_t$$

$$Y_{6t} = \frac{\sqrt{3}}{2}\left(1 - Ƀ + Ƀ^3 - Ƀ^4 + Ƀ^6 - Ƀ^7 + Ƀ^9 - Ƀ^{10}\right)Y_t$$

$$Y_{7t} = \frac{1}{2}\left(1 - Ƀ - 2Ƀ^2 - Ƀ^3 + Ƀ^4 + 2Ƀ^5 + Ƀ^6 - Ƀ^7 - 2Ƀ^8 - Ƀ^9 + Ƀ^{10} + 11Ƀ^{11}\right)Y_t$$

$$Y_{8t} = \frac{\sqrt{3}}{2}\left(1 + Ƀ - Ƀ^3 - Ƀ^4 + Ƀ^6 + Ƀ^7 - Ƀ^9 - Ƀ^{10}\right)Y_t$$

$$Y_{9t} = -\frac{1}{2}\left(\sqrt{3} - Ƀ + Ƀ^3 - \sqrt{3}Ƀ^4 + 2Ƀ^5 - \sqrt{3}Ƀ^6 + Ƀ^7 - Ƀ^9 + \sqrt{3}Ƀ^{10} - 2Ƀ^{11}\right)Y_t$$

$$Y_{10t} = \frac{1}{2}\left(1 - \sqrt{3}Ƀ + 2Ƀ^2 - \sqrt{3}Ƀ^3 + Ƀ^4 - Ƀ^6 + \sqrt{3}Ƀ^7 - 2Ƀ^8 + \sqrt{3}Ƀ^9 - Ƀ^{10}\right)Y_t$$

$$Y_{11t} = \frac{1}{2}\left(\sqrt{3} + \text{Ƀ} - \text{Ƀ}^3 - \sqrt{3}\text{Ƀ}^4 - 2\text{Ƀ}^5 - \sqrt{3}\text{Ƀ}^6 - \text{Ƀ}^7 + \text{Ƀ}^9 + \sqrt{3}\text{Ƀ}^{10} + 2\text{Ƀ}^{11}\right)Y_t$$

$$Y_{12t} = -\frac{1}{2}\left(1 + \sqrt{3}\text{Ƀ} + 2\text{Ƀ}^2 + \sqrt{3}\text{Ƀ}^3 + \text{Ƀ}^4 - \text{Ƀ}^6 - \sqrt{3}\text{Ƀ}^7 - 2\text{Ƀ}^8 - \sqrt{3}\,\text{Ƀ}^9 - \text{Ƀ}^{10}\right)Y_t$$

$$Y_{13t} = \left(1 - \text{Ƀ}^{12}\right)Y_t$$

Now the model is estimated through OLS after generating the series. This model can be estimated by following:

$$Y_{13t} = \alpha + \beta t + \sum_{i-1}^{11} \gamma_i S_i + \sum_{t=1}^{12} \pi_i Y_{it-1} + \varepsilon_t$$

After estimating the equation, the autocorrelation of the residuals is estimated through LM-test. Therefore, autocorrelation test is applied at 1st and 12th lag of residuals with the null hypothesis of no autocorrelation. In case of rejection of null hypothesis lag of dependent variable will be taken until the residuals become white noise. After this, Wald restriction test has been applied at trend, constant and season dummies. By using Wald Test first two hypotheses are investigated independently through one sided t-stat where rest of the hypothesis are inspected jointly through F-statistics value.

$$t: \qquad H_{a0}: \ \pi_1 = 0$$

$$t: \qquad H_{b0}: \ \pi_2 = 0$$

$$f: \qquad H_{c0}: \ \pi_3 = \pi_4 = 0$$

$$f: \qquad H_{d0}: \ \pi_5 = \pi_6 = 0$$

$$f: \qquad H_{e0}: \ \pi_7 = \pi_8 = 0$$

$$f: \qquad H_{f0}: \ \pi_9 = \pi_{10} = 0$$

$$f: \qquad H_{g0}: \ \pi_{11} = \pi_{12} = 0$$

The decision of the stationarity of data is based on these hypotheses, in first two cases the null hypothesis will be rejected if the calculated value of t-statistic is less than critical value which means series is stationary. On the other hand, for the rest of hypotheses, null is rejected if F-stat is greater than critical value and concluding that series is stationary at level.

4.4.3 Measure of Macroeconomic Uncertainty

On assumption of homoscedastic the variance of residual's remains constant over the period. But in financial and some of macroeconomic series clustering volatility is present in many empirical studies. In case of clustering volatility, the variance of μ depends upon its past values. In this situation, it is better to inspect conditional variances instead of unconditional variance (Asteriou & Hall, 2006). The study of Mordi et al, (2015) has used Generalized Autoregressive Conditional Heteroskedasticity (GARCH) model to measure the uncertainty by using the conditional variance approach.

Early literature has provided several of methods to measure the uncertainty and volatility in macroeconomic and financial data. These measures might be standard deviation method, simple moving averages method or by using ARCH and GARCH methodology. Usually moving average method is used to capture volatility in low frequency or annual time-series data. However, to capture the volatility in highly frequency time-series i.e., quarterly, or monthly data G(ARCH) model is extensively used in literature in estimating conditional heteroscedasticity. So, for as our study is concerned, our study is based on monthly data of macroeconomic variables and interested in estimating conditional variance to construct macroeconomic uncertainty index. Therefore, this study used ARCH (q) and GARCH (p, q) methodology to capture conditional variance.

4.4.3.1 ARCH (q) Model

The Autoregressive conditional Heteroskedasticity (ARCH) method is used to model the variances of the time dependent variables of time series data. This model was presented by Robert F. Engle in (1982) to model financial time series that contain volatility clustering and time varying uncertainty. The equation is comprising of conditional mean and conditional variance. Whereas, ARMA (p, q) process is followed by conditional mean equation while, conditional variance equation depends on the past values of residuals.

ARCH equation can be written as:

Conditional Mean Equation

$$r_t = \gamma + \delta X_t + \varepsilon_t$$

Where $\varepsilon_t \sim N(0, \sigma_t)$

Conditional Variance Equation

$$\sigma_t^2 = \alpha_0 + \sum_{i=1}^{q} \alpha_j \ \varepsilon_{t-1}^2$$

Where, $\alpha_0 > 0, \alpha_j \leq 0 \quad i = 1,2,3, \ldots . q$

Where, $\varepsilon_t = z_t \sigma_t, z_t \sim N(0,1)$

In conditional mean equation dependent variable $r_t$is the linear function of X_t and δ is parameter vector. Variable δX_t follows different type of specification and follow the ARMA (p, q) process. In conditional variance equation σ_t^2 is a non-negative and it depends upon residuals of previous time period.

4.4.3.2 The Generalized ARCH (GARCH) model Specification

The ARCH model become unfavorable and loss the degree of freedom if it increases the lag length 'q' in our model. Other limitation of ARCH model is the non-

negative parameter in conditional variance equation. As a substitute of ARCH model Bollerslev (1986) and Taylor (1986) worked independently and proposed Generalized Autoregressive Conditional Heteroskedasticity (GARCH) model. General equation of conditional variance is:

$$h_t = \alpha_0 + \sum_{i=1}^{q} \beta_i \mu_{t-1}^2 + \sum_{j=1}^{p} \delta_j h_{t-j}^2$$

In above equation GARCH model is consist of constant (α_0), lag of squared residuals (μ_{t-1}^2), and variance of previous time period. Whereas, p represents the order of GARCH term and R donates for ARCH. Alexander and Lazar (2006) assumes that $= \alpha_0 > 0;\ \beta_i \geq 0; i = 1,2 \ldots p; \delta_j \geq 0, j = 1,2, \ldots . q;\ \sum_{i=1}^{q} \beta_i + \sum_{j=1}^{p} \delta_j < 1$ for 'h_t' as a weak stationary.

4.5 Variable Description

4.5.1 Company Specific Variables

Our empirical analysis is based on standard risk factors commonly used in stock market returns literature. CAPM explained by Sharp (1964) and Lintner (1965) that market premium is the single factor which influence the equity returns. However, Fama and French (1992, 1993) APT conclude that multiple factors influence the stock market returns. This study also added size premium and (B-to-M) premium and introduce three-factor model. Companies are sorted on size and value.

Size factor represent the overall market capitalization of firm or stock. It distinguishes big and small size firms. Size sorted portfolio is constructed based on market capitalization of each stock. Market capitalization is the number of ordinary shares of a company multiplied by the Market Price of shares (MPS) and calculated annually.

$$Market\ Capitalization = Number\ of\ Outstanding\ Shares\ X\ MPS$$

Whereas, value of a company is identified by comparing its book value and market value. It is calculated by following formula:

$$Book\ to\ Market\ Ratio\ = \frac{Book\ value\ of\ equity}{Market\ value\ of\ equity}$$

The book value is the historical cost or accounting value of the stock. While, market value is the price of shares and the number of shares of that stock in the market. Book-to-market is the price ratio of book value of equity and market value of equity.

4.5.2 Portfolio Construction

- Based on market capitalization, size sorted portfolio is divided into two equal parts. Small market capitalizing companies are sorted as S (Small) whereas, companies with high market capitalization than median are sorted as B (Big).
- Based on B-to-M ratio, Small size sorted portfolio is further split into two groups lowest B-to-M ratio (S/L) and highest b-to-M ratio (S/H).
- Similarly, Big size sorted portfolio is also separated into two categories based on B-to-M ratio and named as (B/L) and (B/H).
- Similar mechanism is repeated to construct the portfolios for each year from 2005-7 to 2018-6.

4.5.3 Construction of Variable:

The averages of portfolios are constructed through following procedure.

The risk attached with the returns related to size of firm is captured by SMB. It defines as the difference of the average returns of two equally weighted small market capitalization and big market capitalization portfolios. It is written mathematically as:

$$Size\ premium = SMB\ = \frac{1}{2}\left[\left(\frac{S}{H} - \frac{B}{H}\right) + \left(\frac{S}{L} - \frac{B}{L}\right)\right]$$

The risk associated with the firm value is captured by the HML. It is the difference of the high B-to-M ratio portfolio returns and low B-to-M ratio portfolio returns. it is defined as:

$$Value\ premium = HML = \frac{1}{2}\left[\left(\frac{S}{H} - \frac{S}{L}\right) + \left(\frac{B}{H} - \frac{B}{L}\right)\right]$$

Theoretically it is assumed that the individual mitigates the unsystematic risk by selecting so many stocks. Therefore, the market portfolio risk is only uncovered to the systematic or non-diversifiable risk (Miller & Modigliani, 1961).

For the proxy of market portfolio KSE-100 index has been used in this thesis. Because this index represents the whole stock market and used as benchmark which consist of leading performing hundred companies based on market capitalization. To improve the market representation, companies with high market capitalization from each sector are also included in this index. Therefore, KSE - 100 index has been used as the proxy of market portfolio. The three-month T-bill is used to mimic risk free rate.

$$\text{Market Premium} = MKT = (R_{mt} - R_{ft})$$

Where,

$$R_{mt} = \log\left(\frac{I_t}{I_{t-1}}\right)$$

Market return is calculated as percentage change in close price of KSE – 100 index.

4.6 Political Risk

To investigate the impact of political risk on stock returns, monthly data set of political risk rating is used which is offered by International Country Risk Guide

(ICRG). These variables are widely used in literature to describe the effect of political instability on equity returns. International country risk guide (ICRG) provides more appropriate and continues risk rating throughout the year. Many researchers use these ratings in their analysis and concluded that International Country Risk Guide (ICRG) is more reliable among all organization providing risk rating. Moreover, these ratings have more explanatory power to predict the stock market movement (Hoti and McAleer, 2005; Lehkonen and Heimonen, 2015; Nebojsa et al., 2015; Toramana and Tuncay, 2017). These political risks are assigned different weightages based on their importance in risk profile. Government stability, Socioeconomic condition, Internal conflict, and External conflict are assigned highest points. The minimum point is zero and the maximum number is twelve, the highest point designates minimum risk and vice versa. These variables are defined as follows:

4.6.1 Government Stability (Maximum points: 12)

It is defined as the ability of government to implement their announced programs and ability to strengthen their political power and continuity to hold the office. This risk is the combination of government unity, legislative strength, and popular support.

4.6.2 Socio-economic Condition (Maximum Points: 12)

This risk rating is based on the socioeconomic problems i.e., unemployment, consumer confidence and poverty which might increase social dissatisfaction in society or effect government actions to implement their plans.

4.6.3 Internal Conflict (Maximum Points: 12)

It measures the impact of political violence, terrorism activity, coup threat and civil disorder in a society and its ultimate actual or potential impact to governance. It is

subdivided into three sub-components and their sum is equal to 12 the highest number shows lowest risk.

4.6.4 External Conflict (Maximum Point: 12)

It is an assessment of degree of cross border conflict, international or diplomatic pressure, trade restriction and sanctions on governance. The countries which are facing minimal diplomatic pressure are assigned higher ratings whereas, countries which are facing lower external issues are provided low points.

4.7 Construction of Political Risk Index

The above-mentioned components are more likely to have highly corelated with each other. To avoid the problem of correlation at the time of estimation we used to construct the political risk Index by using Principal component analysis (PCA). The objective is to measure political risk and the index of these four components will batter reflect the political hazard and capture the impact of political uncertainty on returns. This index has been widely used to aggregating social indicators. By reducing the variability of the variables, the corelated variables are transformed into uncorrelated variables. These uncorrelated variables are the linear combination of original variables. These linear combinations are created in such a way that that each successive component will predict the smaller portion of total variation.

By using Principal component analysis, we constructed the common component of four political risk indicators which captures the different risk dimensions of political instability. If first of the component explains more than of 60% of variances, then there is no requirement to take more principle components (PCs). The higher order of components explains less amount of total variations and can be treated as noise (Bishoi et al., 2009).

Table 3.1: Eigenvalues of Correlation Matrix

	PC1	PC2	PC3	PC4
Eigenvalue	1.8716	1.0582	.75681	.31334
Proportion	0.4679	0.2645	0.1892	0.0783
Cumulative	0.4679	0.7325	0.9217	1.000

Table 3.2: Eigen Vector

	PC1	PC2	PC3	PC4
Government Stability	0.4844	-0.1152	-0.8376	0.2248
Socioeconomic Condition	0.6559	0.0613	0.1745	-0.7319
Internal Conflict	0.3797	0.7658	0.2380	0.4611
External Conflict	0.4370	-0.6296	0.4598	0.4485

Table 3.1 displayed the results of principal component analysis and result suggested that first two PCs (PC1, PC2) explains the 73% of cumulative variation. Therefore, the first two components explain more of the variation and predict batter political risk rather than remaining components.

4.8 Macroeconomic Uncertainty

It is widely accepted that firms' fundamentals such as discount rate, cash flows and investment opportunity is being affected by the unexpected change in Macroeconomic variables. Macroeconomic variables i.e., exchange rate, money supply, inflation and industrial production have significantly affected the prices and rewards. These economic indicators effect the stock returns by several channels. Literature argues that abrupt changes in macroeconomic fundamentals are considered as risk which are interpreted as uncertainty. In our study these risks are quantified by using the time varying conditional volatility of macroeconomic variable. The following

macroeconomic variables are also incorporated in our study to explore the consequences of political instability on equity returns as well as the impact of macroeconomic uncertainty on firm behavior.

4.8.1 Inflation

For Inflation data of Consumer price index (CPI) is used. Which is define as the price of a basket of goods and services for certain time period. Change in inflation affects the discount rate which further effects the share prices of stock. Stock prices are negatively associated with the inflation, as any increase in inflation rises the discount rate and that further decreases the stock returns Chen et al. (1986).

4.8.2 Exchange Rate

Stock prices are affected in two ways with change in exchange rate; expenditure of a company and revenue of a company. Any depreciation in local currency will have two type of impacts one stock returns. If currency depreciated, it will increase the revenue/returns and it might increase the expected cash flows of a stock that will rise the share prices. In contrast, cost of production and the capital flow of the corporation will shrink in result of depreciation of domestic currency and it will decrease of the share price (Dornbusch & Fischer, 1980).

4.8.3 Industrial Production

For growth rate of real economic activity, industrial production is used as a proxy. Cash flows of corporations are affected by the economic activity in a country and which leads to impetus the stock returns. An increase in industrial output will rise the cash flows of the firms and it will also lead to increase the discounted value of cash flow and resulted in rise in the prices of stocks. Therefore, industrial production is positively associated with equity prices.

4.8.4 Money Supply

Money supply affects differently in long run and short run. In short run liquidity of money increases because of an increase in money supply which further rises in the short run prices. Moreover, in case of long run money supply increases the discounted rate and it further decreases the value of shares. Therefore, any increase in money supply resulted in rise of inflation. Thus, any rise in nominal interest rate will rise the discount rate and it will decrease the stock prices.

4.9 Economic Uncertainty Index (MUI)

Macroeconomic risk factors proposed in this study are constructed through conditional variance, these variables are highly corelated to each other. To estimate the significant common variation among these variables it is best to construct an index using principle component analysis (Bali et, al., 2014). By using the PCA we have constructed the single linear combination of risk factors of four macroeconomic variables, that explains most of the time-series variation

Table 3.3: Eigenvalues of Correlation Matrix

	PC1	PC2	PC3	PC4
Eigenvalue	1.47561	1.1012	.954968	.46822
Proportion	0.3689	0.2753	0.2387	0.1171
Cumulative	0.3689	0.6542	0.8829	1.0000

Table 3.4: Eigen Vector

	PC1	PC2	PC3	PC4
Consumer Price Index	0.1323	0.8281	-0.4055	0.3637
Industrial Production	0.7068	-0.0668	0.2299	0.6657
Exchange Rate	0.1966	0.4242	0.8824	-0.0535
Broad Money	0.6666	-0.3603	0.0641	0.6494

By using PCA common component of four different macroeconomic risk factors has been constructed. The results concluded that the second component explains about 65% of the common variation among these four risk factors.

4.10 Model Specification

Different asset pricing models can be used to model the equity premium. Initially, Markowitz (1952) provides the basic theory of risk and return. Further CAPM was introduced by Tobin (1958), Sharpe (1964), Lintner (1965) and Mossin (1966). CAPM, a single factor model was criticized by Ross (1976), Roll (1977) and APT. The APT gave birth to three factor model and multifactor model (Fama and French 2002) three factor model. Similarly, based on different risk factors, microeconomic and macroeconomic risk factor are added into these models. However, political risk factor can also be added into these models to examine the relationship and association with equity premium. In our analysis, the augmented version of Fama and French (2002) multifactor model has been used to explore the influence of size, value, macroeconomic uncertainty, and political risk on equity returns. For this purpose, following models are considered:

$$R_{it} - R_{ft} = \alpha + \beta_1 MKT_t + \varepsilon_t \quad (1)$$

$$R_{it} - R_{ft} = \alpha + \beta_1 MKT_t + \beta_2 SMB_t + \beta_3 HML_t + \varepsilon_t \quad (2)$$

$$R_{it} - R_{ft} = \alpha + \beta_1 MKT_t + \beta_2 SMB_t + \beta_3 HML_t + \beta_4 MUI_t + \beta_5 PRisk_t + \varepsilon_t \quad (3)$$

R_t is return of portfolio predicted for period "t", α is the management impact (Alpha), MKT_t represent the market premium whereas, SMB_t is the size premium of company and HML_t signify the value premium. MUI is used for macroeconomic uncertainty index while, PRisk used for political risk rating index.

The above equations are based on three categories. First model (1) is simple CAPM equation which is a single factor model. Model (2) is F&F (1992) and Daniel and Titman (1997) three factors model including market risk premium, size premium and value premium. Whereas, third equation includes an additional risk factors of macroeconomic risk and political risk along with Fama and French three factor model.

4.11 Hypothesis

The regression model focused on to analysis the impact of firm specific, macroeconomic, and political risk factors on equity returns of Pakistan. it was analyzed for the six size and B-to-M portfolios. The excess returns of each portfolio are regressed on five different risk factors following the fame-Macbeth two pass cross section regression.

Subsequently it is a multivariate regression model, the following hypothesis has been examined.

$$H_1: \alpha = 0$$

$$H_2: \beta_1 = 0$$

$$H_3: \beta_2 = 0$$

$$H_4: \beta_3 = 0$$

$$H_5: \beta_4 = 0$$

$$H_6: \beta_5 = 0$$

Here, α is used to represent the intercept in the model and $\beta_1, \beta_2, \beta_3, \beta_4, and\ \beta_5$ is used to signify the risk sensitivity of excess returns of portfolio. The significance (Statistically different from 0) of the coefficient of these slope indicates that these risk premiums has significant impact on excess returns.

CHAPTER 5

EMPIRICAL FINDINGS AND DISCUSSION

5.1 Monthly Seasonal Unit Root Test

To avoid the spurious results the objective is to estimate the stationarity of the data. We cannot forecast accurate results if the variables are not stationary. Therefore, Beaulieu and Miron (1992) provided a technique to estimate the seasonal unit root in monthly data. The results of t-statistics are used to check stationarity, while Wald test is being used for non-seasonal unit root estimation. Results are presented in following table 4.1.

Table 5.1: Estimated Statistics of Seasonal Unit Root Test by Using Beaulieu and Miron (1992) approach

Hypothesis	**Statistics**	**Variables**					
		CPI	**IP**	**MS**	**Δ MS**	**EXR**	**Δ EXR**
$\pi_1 = 0$	T-Statistics	-4.053**	-4.69**	-2.66	-7.07**	-4.82**	-7.23**
	Critical value	(-2.79)	(-1.91)	(-3.29)	(-3.29)	(-1.91)	(-1.91)
$\pi_2 = 0$	T-Statistics	-3.08**	-4.17**	-3.52	-4.74**	-1.37**	-3.46**
	Critical value	(-1.88)	(-1.88)	(-2.76)	(-2.76)	(-1.88)	(-1.88)
$\pi_3 = \pi_4 = 0$	F-Statistics	7.95**	5.07**	2.02	9.91**	19.88**	11.41**
	Critical value	(3.01)	(3.05)	(7.10)	(7.10)	(3.05)	(3.05)
$\pi_5 = \pi_6 = 0$	F-Statistics	16.97**	6.20**	1.12	10.89**	21.10**	18.61**
	Critical value	(3.06)	(3.11)	(6.48)	(6.48)	(3.11)	(3.11)
$\pi_7 = \pi_8 = 0$	F-Statistics	7.82**	7.78**	9.86	7.22**	0.961**	6.93**
	Critical value	(3.02)	(3.05)	(6.18)	(6.18)	(3.06)	(3.06)
$\pi_9 = \pi_{10} =$	F-Statistics	12.93**	11.13**	1.13	18.74**	13.08**	13.07**
0	Critical value	(3.04)	(3.06)	(6.20)	(6.20)	(3.06)	(3.06)
$\pi_{11} = \pi_{12} =$	F-Statistics	5.17**	6.81**	13.32	6.81**	1.49**	8.32**
0	Critical value	(3.06)	(3.09)	(6.20)	(6.20)	(3.09)	(3.09)
Regression Model		C, NT, ND	NC, NT, ND	C, T, D	C, T, D	NC, NT, ND	NC, NT, ND

*Critical values are taken from Franses and Hobijn (1997) and ** represents the 5% level of significance.*

The above Table 4.1 presents the findings of seasonal unit root by using Beaulieu and Miron (1992) methodology both at level and at first difference. Franses and Hobijn (1997) provides Critical value on yearly bases for estimating unit root in seasonal time series data. Therefore, monthly data is converted into years and critical value of 20 years is obtained after adjustment while, 5% level of significance is considered in this analysis. The results of the analysis show that the value of t-statistics for π_1 is -4.053 and -4.69 and π_2 is -3.08 and -4.17 for CPI and Industrial Production respectively, which are less than the critical value at 5%. So, reject the null hypothesis and concluded no existence of seasonal unit root at zero frequency. Whereas, f-statistic is greater than the critical value concludes that both variables have no seasonal unit root at any frequency. Therefore, series of inflation and industrial production is stationary at level. On the other hand, for broad money t-statistic for π_1 is -2.66 which is greater than critical value at 5% and for exchange rate value for π_2 is also greater than critical value at zero frequency. Therefore, acceptance of null hypothesis implies that broad money and exchange rate are non-stationary. After that, variables are transformed by taking first difference of these series at zero frequency. Same procedure is being implied and calculated the values of stated variables. After transformation, the results indicate that t-values are less than critical for both variables and null hypothesis can be rejected. Therefore, broad money and exchange rate are stationary at first difference.

Serial correlation is estimated through Breusch Godfrey LM-test at 1^{st} and 12^{th} lag for all the series. At 1^{st} lag all the calculated values are less than the tabulated value of chi-square 3.841. Therefore, we are unable to reject null hypothesis and concluded that at 1^{st} lag shows no appearance of serial correlation. Similarly, the study also estimated the value at 12^{th} lag and concluded that calculated values are also less than

the chi-square 21.026. These estimations showed no existence of serial correlation at 1st and 12th lag.

Finally, the estimated results concluded that inflation and industrial production are level stationary and having no problem of autocorrelation. Hence, money supply and exchange rate are stationary at first difference with no problem of serial correlation. So, in next section we will apply ARCH GARCH methodology to estimate the conditional variances of CPI and Industrial Production. Whereas, stationarity is prerequisite condition for ARCH and GARCH type modeling.

5.2 Estimating Conditional Variance

This section will provide information about data generating process of Inflation and industrial production. In this section results of diagnostic test will also explain about the presence of autocorrelation.

5.2.1 Estimation of ARCH and GARCH modeling

This study used the GARCH methodology to capture the effect uncertainty and volatility. There is necessary condition that series must have an ARCH effect to run GARCH type models. Therefore, ARCH-LM test has been applied on mean equation of the series to examine the existence of ARCH effect. The finding shows that both series have ARCH effect as their probability value is less than 5% and it cause in rejection of the null hypothesis of there is no ARCH effect.

Table 5. 2: ARCH Mean Equation

Mean Equation					
Consumer Price Index (CPI)			**Industrial Production (IP)**		
	Coefficient	P-value		Coefficient	P-value
Constant	2.7498	0.8549	Constant	43.6927	0.1600
AR (1)	0.9887	0.000	AR (1)	0.9998	0.000
MA (1)	0.5506	0.000	MA (1)	-0.6213	0.000
Log Likelihood		189.159	Log Likelihood		301.233

$H_0 = There\ is\ No\ ARCH\ effect, \quad H_1 = ARCH\ effect\ Exist$

After the conclusion of presence of ARCH effect, in this analysis to capture uncertainty we have applied different GARCH specific models.

Table 5. 3: Variance Equation

Variance Equation					
Consumer Price Index (CPI)			**Industrial Production (IP)**		
	Coefficient	P-value		Coefficient	P-value
Constant	0.0395	0.1600	Constant	0.0072	0.8471
ARCH (1)	0.0722	0.0168	ARCH (1)	0.8594	0.000
GARCH (1)	0.8769	0.000	GARCH (1)	0.9873	0.000
Persistence		0.9491	Persistence		0.8603

In table 5.3 high persistence of shocks 0.94 for CPI whereas, 0.86 for IP has appeared that converges to long period. Conditional variance equation follows the GARCH (1,1) process. Results concludes that mean equation and variance equation both are significant as their t-probability values are less than 5%. While residual

diagnostic also concludes that both series are normally distributed, with no problem of autocorrelation and ARCH effect. Based on these results we constructed single linear index of uncertainty by using PCA which has already been explain in previous section.

5.3 Descriptive Statistics

The accuracy of the data is identified through descriptive statistics. These statistics are used to provide information about behavior of dependent and independent variables. The mean value provides information about the average returns whereas, standard deviation represents the deviation of data from its average point. Skewness determines the symmetry of data, either data is positive or negatively skewed. Kurtosis represent the mass of the distribution tail from its center. The descriptive statistics also provide information about maximum and minimum value in the data. Result of financial data is reported in table.

Table 5.4: Size and B-to-M ratio sorted portfolios

Variables	Mean	Median	Maximum	Minimum	Std. Dev.	Skewness	Kurtosis
P	.0039	.0047	.3227	-.2701	.0775	-.2367	2.7681
S	.0051	-.0035	.2481	-.2521	.0842	.2249	0.5801
B	.0030	.0052	.7518	-.6211	.1040	.5925	25.083
S-H	.0096	.0052	.4565	-.2790	.1037	.6885	2.6233
S-L	.0032	-.0018	.2200	-.2605	.0862	-.0681	0.1255
B-H	.0036	.0036	.6788	-.5562	.1028	.3844	16.957
B-L	.0024	.0072	.8425	-.6992	.1113	.7234	30.798

Table 5.4 determines the basic statistical descriptive i.e., mean, median, standard deviation, maximum, minimum, skewness and kurtosis of portfolios arranged on their size and value. Mean represent the average returns of stocks and their range is from 0.0005 to 0.0096. The results indicate that S-H has earned highest average return

of 0.0096 with the risk of 0.1037. whereas, minimum average profit is 0.0024 with risk of 0.1113 attained by B-L portfolio.

The value of skewness exactly equals to zero indicates normal distribution but in real world it is not likely to happened. In this case except S-L all the values of skewness are positive which specify that distribution is positively skewed.

Value of the kurtosis shows the peak and flatness of the distribution. In case of normally distribution the value of kurtosis is equals to 3. The value larger than 3 represent that distribution has peaked or leptokurtic. whereas, the value less than 3 shows platykurtic distribution of data. In this analysis the results of kurtosis are 0.5801, 25.083, 2.6233, 0.1255, 16.957, 30.798 for S, B, S-H, S-L, B-H and B-L, respectively.

Table 5.5: Descriptive statistic: Multi-Factor Model Size and B-to-M sorted portfolios

Variables	MKT	SMB	HML	MUI	PRisk
Mean	0.0033	0.0021	0.0042	0.0013	-0.0317
Median	0.0120	-0.0037	0.0039	0.3215	-0.0042
Maximum	0.1707	0.7644	0.2483	1.5293	2.3291
Minimum	0-.4605	-0.8653	-0.1152	-2.6756	-1.9766
Std.Dev	0.0701	0.1097	0.0429	1.2147	1.1953
Skewness	-2.2755	-1.0195	1.0499	-.9706	-.0658
Kurtosis	12.1496	39.181	6.1731	.6998	-1.0719

Table 5.5 represent the descriptive statistics of variables for Multi-factor model. These variables are market, value, size premium, macroeconomic uncertainty, and

political risk premium. Market premium shows 0.0033 its mean value along with 0.071 standard deviation. Size premium have 0.0021 mean value and 0.0088 its Std. Whereas, B/M (value Premium) have mean value .0042 and its Std. is 0.0429. The mean value of macroeconomic uncertainty index is 0.1218 with standard deviation of 0.8511. Average and standard deviation value for political risk is -0.0317 and 1.1954. The statistical characteristics shows that all the stated variables are positive except political risk factor. This may be because during this period Pakistan has experienced more vulnerable political situation. The maximum value represents the maximum premium demand for investor for taking risk. Here, the maximum value is 0.1707, 0.7644, 0.2483, 1.5293, 2.3291 for market, size, value, macroeconomic uncertainty, and political risk, respectively. similarly, -0.4605, 0.8653, -0.1152, -2.6756, -1.9766 is minimum premium demanded by the investor. Here, the value of kurtosis is 12.1496, 39.181, 6.1731, for market, size and value premium which shows that distribution of data is leptokurtic whereas, for MUI and Political risk distribution of data is platykurtic 0.6998, -1.0719.

The findings of the study in table 4.5 indicates that the average premium for these variables are positive except political risk. Similarly, political risk factor also indicates the higher volatility during the study period. It is worth mentioning that political risk has shown more volatile than other variables in this analysis. This could be because during this period Pakistan has experienced changes in different political regimes, terrorist activities, protests, and conflict on eastern and western boarders.

5.4 Multi-Factor Regression

By using F&F multifactor model we analyses the size, value, macroeconomic uncertainty, and political risk premium. The intercept β coefficient represent the slope and significant of the variable is denoted by the t-statistics. Probability value and t-

statistics signifies the impact of individual variable. Whereas, R^2 shows that how much variation in dependent variable is due to independent variable. The adjusted R^2 represent the improvement in the model due to addition of new predictor. The value of F significance represents the goodness of fit for overall model and null hypothesis of the study. It explains the fitness of model if F-sig is greater than 5%.

Table 4.6 define the impact of size, value, macroecon0mic uncertainty and political risk on Pakistan stocks equity returns. Results of size and value sorted portfolios are given.

Table 5.6: Multi-Factor Regression on Portfolios Sorted for Size and Book-to-Market Ratio

	Constant	**MKT**	**SMB**	**HML**	**MUI**	**PRisk**	**Adj.R^2**	**F-stat**	**F-sig**
P	.0013	.76874							
T-stat	.3068	11.9994					0.4798	143.9873	0.00
P-value	.7594	0.00							
P	.0021	.7547	-.0920	-.1176					
T-stat	.4725	11.9358	-2.1511	-1.0820			0.5002	52.7080	0.00
P-value	.6372	0.00	0.0329	0.2809					
P	.0018	.73581	-.0899	-.1146	.0026	-.0097			
T-stat	.2861	11.8124	-2.1203	-1.0651	0.7222	-2.5624	0.5678	79.91913	0.00
P-value	.7751	0.00	0.0301	0.2885	0.4712	0.0113			
S	.0026	.6899							
T-stat	.4851	8.6969					0.3250	75.63613	0.00
P-value	.6283	0.00							
S	.0021	.7570	.4034	-.1194					
T-stat	.4789	11.9678	9.4261	-1.0984			0.5766	71.3780	0.00
P-value	.6326	0.00	0.00	.2737					
S	.0018	.7403	.4055	-.1163	.0027	-.0096			
T-stat	.4274	11.8154	9.6705	-1.080	0.7111	-2.5550	0.5953	54.6023	0.00
P-value	.6696	0.00	0.00	0.2817	0.4781	0.0116			
B	.0013	.8476							
T-stat	.0195	8.6302					0.3216	74.48062	0.00
P-value	.9844	0.00							
B	.0021	.7525	-.5867	-.1171					
T-stat	.4825	11.872	-13.680	-1.0746			0.7267	134.70	0.00
P-value	0.6301	0.00	0.00	0.2842					

	Constant	MKT	SMB	HML	MUI	PRisk	Adj.R^2	F-stat	F-sig
B	.0018	.7356	-.5847	-.1140	.0027	-.0098			
T-stat	.4309	11.7233	-13.932	-1.057	0.7210	-2.5765	0.7539	86.4990	0.00
P-value	.6672	0.00	0.00	0.2921	0.4719	0.0109			
S/H	.0072	.7148							
T-stat	.9922	6.8506					0.2285	46.9318	0.00
P-value	.3226	0.00							
S/H	.0030	.7895	.4957	.7191					
T-stat	.6652	11.8913	11.0350	6.2980			0.6719	117.062	0.00
P-value	.5069	0.00	0.00	0.00					
S/H	.0027	.7657	.4982	.7319	.0027	-.0121			
T-stat	.6037	11.7293	11.404	6.5148	0.5012	-3.0588	0.7187	76.4514	0.00
P-value	.5469	0.00	0.00	0.00	0.6169	0.0031			
S/L	-.0018	.6722							
T-stat	-.3085	8.0983					0.2941	65.5826	0.00
P-value	.7581	0.00							
S/L	.0012	.7315	.3103	-0.9393					
T-stat	.2424	10.8477	6.8018	-8.0992			0.5404	61.759	0.00
P-value	.8087	0.00	0.00	0.00					
S/L	.0001	.7214	.3122	-.9462	.0044	-.0073			
T-stat	.0236	10.719	6.9404	-8.1746	1.2393	-1.8095	0.5735	41.4438	0.00
P-value	.9812	0.00	0.00	0.00	0.1992	0.0724			
B/H	.00064	.8695							
T-stat	.09685	9.1311					0.34703	83.3781	0.00
P-value	.92297	0.00							
B/H	.0031	.7895	-.5042	-0.2808					
T-stat	.6652	11.8913	-11.224	-2.4597			0.6769	114.365	0.00
P-value	.5069	0.00	0.00	0.0150					
B/H	.0027	.7660	-.5018	-.2668	.0028	-.0128			
T-stat	.6037	11.7293	-11.484	-2.387	0.5012	-3.0075	0.7041	74.739	0.00
P-value	.5458	0.00	0.00	.0184	.6169	.0026			
B/L	-.0004	.8450							
T-stat	-.0552	7.7967					0.2784	60.7900	0.00
P-value	.95598	0.00							
B/L	.0012	.7315	-.6896	.0606					
T-stat	.2424	10.8477	-15.112	.5228			0.7044	136.8185	0.00
P-value	.8087	0.00	0.00	.6018					
B/L	.0009	.7110	-.6578	.0537	.0045	-.0074			
T-stat	.2076	10.7097	-15.275	0.1157	1.1293	-1.7903	0.7409	85.8066	0.00
P-value	.8351	0.00	0.00	0.4644	0.1992	0.0762			

The analysis is based on multivariate regression portfolio. The portfolio of big (B) and small (S) stock are used as dependent variables. Whereas, market, size, value premium, macroeconomic uncertainty and political risk is considered as independent variable. Step by step results of regression are reported in the table 4.6.

In above table 4.6 portfolio (P) represent the average portfolio, by using the CAPM is been regressed by market premium the result shows significant t-value with positive coefficient. It is worth mentioning that the standard CAPM appears to be positive and significant for all portfolios. It specifies that variation in stock market is well explained by the market premium. The result of single factor model indicates that market is positive and significant for all portfolios. It is consistent with the theory of CAPM that market premium is directly related to stock returns. The results for the single factor indicate that average value of adjusted R^2 is approximately 32%, which means CAPM does not explains all the variation in stock returns. Thus, additional factors could be incorporated into the model to predict the variation of excess returns.

In next step, Fama and French proposition is used to explain the predictability of the model by adding additional factors of size and value premium in the regression analysis. The average value of adjusted R^2 of regression is approximately 62%, which is significantly higher than the single factor regression model. Theoretically, Considerably Significant change assume to be an improvement in the model. In this case, the value of adjusted R^2 increase from 33% to 62% shows that FF3F model has more predictability of variation than the CAPM. Theoretically, if the model predicts the variation in expected returns efficiently, then the regression results of intercepts should close towards zero and the slope of coefficient should be significant. The findings of this thesis are persistent for the validation of FF3 model. The estimated

coefficients are significant and supportive in existence market size and value premium in Pakistan stock market.

All the market factor loadings are significant at 1% and reflect positive impression to the market risk. The size premium has significant positive coefficient for all firms except B/H and B/L, however, the value effect is not reported in B/L portfolio. The signs of the intercept of all the portfolios are persistence with the fama and French proposition. The coefficient of size premium (SMB) for small portfolio (S/H) are positive while negative for big size firms (B/H and B/L) demonstrating the existence of size premium. Similarly, the signs of HML portfolio also confirms the existence of value premium. The coefficient for high BM stocks (B/H) is negative and for low value stocks (S/H) is positive confirming the existence of value premium. The comprehensive performance of the model is sufficient with high value of adjusted R^2. The findings of FF3F model adequate the existence of size and value premium in Pakistan's stock market.

In order to investigate the influence of macroeconomic and political uncertainty on the excess returns these additional factors are incorporated in regression analysis. The results of macroeconomic uncertainty have not shown any considerable effect on returns. Thus, macroeconomic factors are not reliable to capture the price effect. whereas, the political instability has significant negative impact on excess returns in case of Pakistan. The average value of adjusted R^2 of regression is approximately 67%, which is significantly higher than the CAPM and F&F three-factor regression model. Theoretically, Significant change in the value assume to be an improvement in the model. An increase in average value of adjusted R^2 improves the overall performance and increase the explanatory power of the model in predicting the stock returns due to additional factors.

In above table 4.6 portfolio (P) represent the average portfolio, by using the CAPM variable is been regressed by market premium the result shows significant t-value with positive coefficient. The value of t-stat is 11.9994 which is greater than 2, specifies that variation in stock market is well explained by the market premium. Whereas, adjusted R^2 indicates that 47.9% variation in dependent variable is explained by the market premium. Fama and French result for portfolio (P) adequate that market and size premium have significant while value is insignificant for excess returns. Afterward, this study includes other variable MUI and Prisk in this model. The findings suggest that value of market premium is positive significant while size premium and political risk is negatively significant. Findings also reported that value of adjusted R^2 increased at 56.7% which means in portfolio P, 57% variation is explained by additional variables.

Similarly, small (S) portfolio is also regressed with market premium by using CAMP. The findings support significant and positive returns on portfolio with 8.6969 t-stat. The adjusted R^2 indicates that 32.50% variation in dependent variable is explained by the market premium. Similarly, F&F result reported that MKT and SMB is significantly positive while value premium has no significant impact. Afterwards, including additional risk factors, the result suggested that market and size premium has positive coefficient and significant t-value whereas, political risk shows negative but significant impact on portfolio return. Finding of the study further explains that by adding additional premiums the explanatory power of the model increased from 32.50% to 59.53%.

Furthermore, big size (B) sorted portfolio explains that market premium has the positive and significant t-value of 8.6302. The adjusted R^2 represent that 32.16% variation is explained by the market premium. The results of F&F advocate that MKT

and SMB is significantly positive while value premium has no significant impact. Later, including additional risk factors in the model the value of adjusted R^2 increases from 32.16% to 75.39% which means independent variable well explained by additional factors. The findings indicate that market premium has positive significant impact whereas size and political risk premium negatively affect the portfolio returns.

The value of t-stat for S/H sorted portfolio for single factor model is 6.8506. which means market premium is significant and positive with S/H sorted portfolio with having the value of 22.85% of adjusted R^2. Results of three factor model explains that MKT, SMB and HML stocks are significantly positive related to S/H sorted portfolios. By analyzing additional factors, market premium remains positive and significant along with size and value premium whereas, political risk shows negative but significant value for portfolio. While, the value of adjusted R^2 increased from 22.85% to 71.87%.

The findings of S/L portfolio for single factor model indicates that market is positive and have significant t-value of 11.7693. By using three factors model the findings suggested that market and size premium is positive and significant for S/L sorted portfolios, while, negative for value premium. By analyzing additional factors in the model, the value of market and size premium have positive significant impact. Furthermore, value and political risk has negative and significant impact for S/L portfolio. Adjusted R^2 increases from 29.41% to 57.35 which represents the increase of explanatory power of the model.

For B/H portfolio the coefficient of market premium is positive and significant with the value of t-statistics 9.1311. Adjusted R^2 shows that 34.70% variation is explained by market. The results of FF3F model concluded that MKT is positive while size and value premium is negatively significant for B/H sorted portfolios. Whereas,

after including MUI and Political risk the value of adjusted R^2 increased to 70.41%. Although market premium has positive significant impact, but size, value and political uncertainty shows negative significant impact on returns.

Similarly, B/L portfolio is regressed by the single factor which is market premium and the finding suggested t-value of market is significant and positive. The value of adjusted R^2 shows that single factor explains 27.84% variation in stock return. The results of three factor model conclude that market and size premium have significant impact while value premium is insignificant for the stock. After adding additional risk factors market premium shows positively significant effect on returns while, size and political risk shows negative but significant coefficient. By considering the value of adjusted R^2 the results also suggested that multi-factor model have more explanatory power than single asset pricing model.

5.5 Decision

The results of regression analysis deduced the asset pricing mechanism by using CAPM and F&F asset pricing methodology for the non-financial stocks in equity market of Pakistan. The monthly data for Market, size premium, value premium, macroeconomic uncertainty and political risk is taken from June 2005 to June 2018. Specifically, this thesis apply regression in three steps to measure the effect of these specific variables in Pakistan. Main findings of the study are as follow.

First, the result of single factor model indicates that market is positive and significant for all portfolios. It specifies that variation in stock market is well explained by the market beta and CAPM is prominent to describe the association with market premium and stock returns. whereas, single market premium is not enough to capture all the risks related to excess returns. In next step, the empirical findings of the study

demonstrate the significant impact of Fama and French model in Pakistan's market. The results reviled that the size and value premium has significantly influence the excess return. The regression analysis shows that size premium has positive and significant impact on small portfolio while, it has significant but negative association with returns of big stock. Further, the findings suggest that value premium is significant and negative for high book to market stock (B/H), but it is insignificant for low book to market (B/L). The empirical results also provide evidence that the average value of adjusted R^2 of regression is significantly higher than the single factor regression model.

To investigate the influence of macroeconomic and political uncertainty on the excess return's additional factors macroeconomic uncertainty and political risk are incorporated in regression analysis. The results of macroeconomic uncertainty have not shown any considerable effect on returns. Thus, macroeconomic factors are not able to capture the price effect. whereas, the political instability has significant negative impact on excess returns in case of Pakistan. The average value of adjusted R^2 of regression is approximately 67%, which is significantly higher than the CAPM and F&F three-factor regression model.

By and large, following the empirical findings, the study concluded that the size and B-to-M (value) factors are consistently and significantly exist while, macroeconomic uncertainty has not shown considerable impact in Pakistan's equity market. Along with size and value premium political risk also contribute to the variation of excess returns. In emerging economies, the investors are more anxious about the size of firm and political situation of the country. since, panic situation prevails in such markets. Therefore, investor consider these risks before making any investment decision.

CHAPTER 6

CONCLUSION

6.1 Summary

Study focused on to analysis the impact of firm specific and political risk associated with equity returns of Pakistan. For analysis, monthly data set of 120 non-financial firms are selected which are listed at PSX. To capture macroeconomic uncertainty ARCH, GARCH modeling is employed and afterward, an index is constructed using PCA. Similarly, political risk index for four political risk variables is also constructed through PCA. To estimate the stationary of the variables this study employs Beaulieu and Miron (1992) seasonal unit root analysis.

The findings of the study have major implication on equity returns of Pakistan. The regression results specify that CAPM is prominent to describe the association with market premium and stock returns. whereas, single market premium is not enough to capture all the risks related to excess returns. The empirical findings of the study demonstrate the significant impact of Fama and French model in Pakistan's market. The results reviled that the size and value premium has significantly influence the excess return. The regression analysis shows that size premium has positive and significant impact on small portfolio while, it has significant but negative association with returns of big stock. Further, the findings suggest that value premium is significant and negative for high book to market stock (B/H), but it is insignificant for low book to market (B/L). These findings of firm's specific variable are parallel with the findings of Nawazish, (2008) (Hassan & Javed 2011), Mirza et al. (2013) and Baek & Bilson (2015) Ali et al. (2018).

Furthermore, the study also investigates the impact of political risk on Pakistan's stock returns. There is also a worth mentioning that political risk has shown negative and significant impact for all stocks except B/L. It concluded that political uncertainty effects equity market of Pakistan. These results are similar with the empirical findings of Henderson and Garza Rodriguez (2008), Henisz and Zelner (2010) Lehkonen & Heimonen (2015), Nazir et al. (2018) and Hill et al. (2019). Finding of the study concluded that uncertanity about political situation negitively effect the stock returns and increase the risk of loss for the investor. In emerging economies, the investors are more anxious about the size of firm and political situation of the country. since, panic situation prevails in such markets. Therefore, investor consider these risks before making any investment decision. Therefor, investor is always reluctant to invest in uncertian political situation in fear of loss. The finding of the study is also robust with the previous leterature that F&F multifactor model has more predictability than CAPM.

6.2 Limitation of the Study

This study only considers the non-financial sector of Pakistan, but this study can be extended further to financial sector of Pakistan. The time period of this study is from June 2005 to June 2018 during this period Pakistan has experienced military and democratic government. The study can be subdivided into different political regimes to investigate the impact of political crises in different style of government. Furthermore, portfolios are sorted for small and big based on median, but it can be further divided into small, medium and big.

6.3 Policy Implications

Economic and political conditions are interconnected with each and other. In country like Pakistan where political condition is not stable and stock market reacts on any change in political situation. Therefore, volatile behavior has been shown in stock market. To absorb the shocks of political uncertainty the investor should have to diversify their investment. There is not a long run impact of these shocks therefore, investors should not have to be panic and sell all the securities immediately. To protect the financial market from political unrest the regulatory authorities have to take considerable steps. To increase the confidence level of the investors in the cataclysmic situation, the companies need to provide supplementary information to the asset holders. To improve the confidence of the investors, government have to improve law and order situation in a country. The findings suggest that disastrous political situation adversely affect the firm equity premium, therefore, it is inescapable to improve the political situation in the country to improve equity market.

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APPENDIX

Year	Number of Companies
2005-2006	126
2006-2007	125
2007-2008	127
2008-2009	119
2009-2010	127
2010-2011	122
2011-2012	118
2012-2013	121
2013-2014	121
2014-2015	122
2015-2016	123
2016-2017	116
2017-2018	112